## REMARKS

### Summary of the Office Action

In the Office Action, claims 3-10 have been indicated as containing allowable subject matter.

The drawings stand objected to for minor informalities.

Claims 1, 2, 11 and 13 stand rejected under 35 U.S.C. § 102 (e), as being anticipated by U.S. Patent No. 6,423,099 to *Iversen*.

Claim 12 stands rejected under 35 U.S.C. § 103 (a), as being unpatentable over *Iversen*.

### Summary of the Response to the Office Action

Applicant proposes amending claims 1, 3 and 6-10 to further clarify the language thereof, canceling claim 2, and adding new claims 14-20. Accordingly, claims 1 and 3-20 are pending for further consideration.

### Objection to the Drawings

In the Office Action, the drawings have been objected to for not including the features recited in dependent claim 12.

With regard to the drawings, Applicant respectfully asserts that as required under 37 C.F.R § 1.81(a) and 35 U.S.C. § 113, it is stated that "[t]he applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented." Applicant respectfully asserts that the features recited in dependent claim 12, such as the covering of aesthetically acceptable material having an appearance generally similar to that of a normal hand, are clearly understandable as described in the originally filed specification, especially when viewed by one of ordinary skill in the art of prosthesis mechanisms and the like. Applicant therefore respectfully asserts that no new drawing Figure is required for the covering recited in dependent claim 12.

Applicant therefore respectfully requests withdrawal of the objection to the drawings.

**All Claims are Allowable**

In the Office Action, claims 3-10 have been indicated as containing allowable subject matter. Claims 1, 2, 11 and 13 stand rejected under 35 U.S.C. § 102 (e), as being anticipated by U.S. Patent No. 6,423,099 to *Iversen*. Claim 12 stands rejected under 35 U.S.C. § 103 (a), as being unpatentable over *Iversen*. Applicant respectfully traverses these rejections for the following reasons.

New Independent claims 7 and 8

With regard to claims 3-10, which have been indicated as containing allowable subject matter, Applicant respectfully thanks the Examiner for the indicated allowability of claims 3-10. Moreover, Applicant proposes rewriting original dependent claims 7 and 8 in independent form, including all the limitations of the base claims from which they depend. Therefore, Applicant respectfully asserts that new independent claims 7 and 8, and new dependent claims 14-20, which respectively depend therefrom, are now allowable as presented.

Independent claim 1

With regard to claim 1, and remaining dependent claims 3-6 and 9-13, Applicant respectfully traverses the rejections of claims 1, 3-6 and 9-13 for the following reasons.

With regard to independent claim 1, Applicant respectfully asserts that *Iversen* does not teach or fairly suggest an externally-powered prosthesis mechanism usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations, "wherein said planetary gear stage includes at least one input and at least one output planetary gear stage, said motor is operatively connected to drive said input planetary gear stage, said input planetary gear stage is operatively connected to drive said output planetary gear stage, said output planetary gear stage being operatively connected to drive said grasping mechanism to said opened configuration when said motor is driven in said first direction and further drive said grasping mechanism to said closed configuration when said motor is driven in said second opposite direction, and wherein said motor includes a drive shaft, said input planetary gear stage and said drive shaft include a generally common central axis, such that said externally-powered prosthesis mechanism is usable with persons with amputations at or proximal

to the level of the metacarpophalangeal joint, as well as persons with high-level amputations," as recited in independent claim 1, as amended.

Support for these features recited in claim 1 can be found at least in Paragraphs [0018], [0019] and [0031]-[0052] of the originally filed specification, and in Figs. 1-9 of the originally filed drawings. Specifically, as shown in Figs. 1 and 6-9, the present invention provides an externally-powered prosthesis mechanism 100 usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations. The prosthesis mechanism includes a grasping mechanism 105 having at least one mechanically operable finger member 142 and at least one mechanically operable thumb member 166 kinematically linked to the finger member. Finger member 142 and thumb member 166 are kinematically linked such that the grasping mechanism is disposed in respective opened and closed configurations when the finger member is respectively moved away from and toward the thumb member. Prosthesis mechanism 100 further includes a drive system extending tangentially with respect to the grasping mechanism, the drive system including a motor operatively connected to drive at least one planetary gear stage (i.e. stages 114, 116, 118, and 164 in Figs. 6 and 7).

In the embodiment of Fig. 1, the planetary gear stage (114, 116, 118 and 164) are operatively connected to drive the grasping mechanism to the opened configuration when the motor is driven in a first direction, and further drive the grasping mechanism to the closed configuration when the motor is driven in a second opposite direction. With gear stages 114, 116 and 118 being input planetary gear stages, gear stage 164 is an output planetary gear stage, and motor 104 is operatively connected to drive the input planetary gear stages (114, 116 and 118), which are further operatively connected to drive the output planetary gear stage (164). The output planetary gear stage thus drives grasping mechanism 105 to the opened configuration when the motor is driven in the first direction and further drive the grasping mechanism to the closed configuration when the motor is driven in the second opposite direction. As shown in Fig. 6, motor 104 further includes a drive shaft and is disposed in relation to the input/output planetary gear stages, such that the input planetary gear stage and the drive shaft include a generally common central axis. Based upon the configuration of prosthesis mechanism 100

discussed above, the mechanism is therefore usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations.

The Office Action cites *Iversen* as teaching or suggesting the invention as recited in claims 1, 2 and 11-13.

*Iversen*, as illustrated in Figs 1-4 thereof, discloses a grip device 10 for an artificial or prosthetic arm, including at least two opposable digits 12, 15 and a drive linkage powered by a drive motor 14, such that when the drive motor is powered it enables the two opposable digits to grip, (Col. 3:20-30). The drive linkage includes a drive and transmission having friction planetary input 18 for driving friction rollers 20, and further planet gears 40 (designated as output planetary gear stage in Office Action).

Contrary to the recitation in independent claim 1 of the present invention, *Iversen* does not teach or fairly suggest an externally-powered prosthesis mechanism usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations, "wherein said planetary gear stage includes at least one input and at least one output planetary gear stage, said motor is operatively connected to drive said input planetary gear stage, said input planetary gear stage is operatively connected to drive said output planetary gear stage, said output planetary gear stage being operatively connected to drive said grasping mechanism to said opened configuration when said motor is driven in said first direction and further drive said grasping mechanism to said closed configuration when said motor is driven in said second opposite direction, and wherein said motor includes a drive shaft, said input planetary gear stage and said drive shaft include a generally common central axis, such that said externally-powered prosthesis mechanism is usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations," as recited in independent claim 1, as amended.

Specifically, as discussed above and as illustrated in Fig. 3 of *Iversen*, The drive linkage includes a drive and transmission having friction planetary input 18 for driving friction rollers 20, and further planet gears 40 (designated as output planetary gear stage in Office Action). As clearly evident from Fig. 3 of *Iversen*, motor 14 is disposed in the hole provided in base 11 such that it drives friction planetary input 18 by means of belt 16. This configuration is essential for *Iversen*, since the invention thereof is directed to overcome the drawbacks of prior art prosthesis

mechanisms, which are "too large and complex," (see Col. 1:18-20). Moreover, as discussed in Col. 6:66 – Col. 7:24, especially Col. 7:10-13, *Iversen* clearly states that "[t]he shortening of the drive mechanism in the hand allows a wrist member and drive to fit within the space of a normal human hand," and that "this belt/pulley system is more quiet than a gear drive." As further discussed in Col. 7:14-17, *Iversen* further states that "[t]his significant rearrangement of the motor by using a belt/pulley system, as opposed to a direct gear drive, allows the machinery driving the grip device or prosthetic hand to be shortened," and that "[t]his in turn enables a mechanical wrist flexion or wrist rotation device to be attached to the prosthetic hand."

Thus, the grip device of *Iversen* clearly requires the use of a motor and a belt/pulley as shown in Fig. 3 thereof such that the "machinery driving the grip device or prosthetic hand [is allowed] to be shortened," (Col. 7:14-17).

On the contrary, the provision of the arrangement illustrated in Figs. 6 and 7 of the present invention enables motor 104 to be placed in-line with both the input (114, 116 and 118) and the output (164) planetary gear stages. In other words, the provision of the arrangement illustrated in Figs. 6 and 7 of the present invention enables input planetary gear stages (114, 116 and 118) to be disposed along the central axis of the drive shaft of motor 104.

Thus *Iversen* clearly does not teach or fairly suggest an externally-powered prosthesis mechanism usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations, "wherein ... <u>said input planetary gear stage and said drive shaft include a generally common central axis</u>," as recited in independent claim 1, as amended.

Furthermore, Applicant also respectfully asserts that *Iversen* does not teach or fairly suggest an externally-powered prosthesis mechanism, "wherein ... <u>said externally-powered prosthesis mechanism is usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations</u>," as recited in independent claim 1, as amended.

Specifically, based upon the discussions above, the grip device of *Iversen* is directed to an externally powered hand suitable for persons with a trans-radial (forearm) amputations, possibly wrist disarticulation amputations, and at a stretch (with serious modification) for

persons with transcarpal amputations. The grip device of *Iversen* is however not suitable, nor would it be modified by someone skilled in art, for use by persons with transmetacarpal amputations because the overall device would be too long.

For example, whereas *Iversen* does provide for the use of a transverse motor coupled to the kinematically linked fingers and thumb by a belt drive, the provision of the motor belt/drive system requires the drive system to be mounted behind the pivot point of the fingers and thumb (see Figs. 1 and 3 *Iversen*), and not in-line with the knuckles as such a system including the motor, clutch and gearhead would be too wide to be accommodated in the width of a normal hand. Due to this relatively wide drive system, the grip device of *Iversen* is only suitable for persons with a trans-radial (forearm) amputations, and possibly wrist disarticulation amputations.

On the contrary, the provision of the motor 104 being disposed in-line with both the input (114, 116 and 118) and the output (164) planetary gear stages, in the embodiment illustrated, enables the externally-powered prosthesis mechanism of the present invention to be used with persons with amputations at or proximal to the level of the metacarpophalangeal joint (i.e. persons who have lost one or all digits (thumb and fingers) but still retain a palmar surface of the hand), and persons with high-level (i.e. above-elbow) amputations where weight considerations are of paramount importance.

Based upon the distinctions noted above, Applicant respectfully asserts that *Iversen* does not teach or fairly suggest an externally-powered prosthesis mechanism usable with persons with amputations at or proximal to the level of the metacarpophalangeal joint, as well as persons with high-level amputations, "wherein said planetary gear stage includes at least one input and at least one output planetary gear stage, said motor is operatively connected to drive said input planetary gear stage, said input planetary gear stage is operatively connected to drive said output planetary gear stage, said output planetary gear stage being operatively connected to drive said grasping mechanism to said opened configuration when said motor is driven in said first direction and further drive said grasping mechanism to said closed configuration when said motor is driven in said second opposite direction, and wherein said motor includes a drive shaft, said input planetary gear stage and said drive shaft include a generally common central axis, such that said externally-powered prosthesis mechanism is usable with persons with amputations at or proximal

to the level of the metacarpophalangeal joint, as well as persons with high-level amputations," as recited in independent claim 1, as amended.

As pointed out in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim." "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Moreover, as pointed out in M.P.E.P. § 2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art". *In re Royka*, 409 F.2d 981, 180 USPQ 580 (CCPA 1974). Since these criteria have not been met, Applicant respectfully asserts that the rejection under 35 U.S.C. § 102 (e) should be withdrawn because *Iversen* does not teach or suggest each feature of independent claim 1, as amended.

In view of the above arguments, Applicant respectfully requests the rejection of independent claim 1 under 35 U.S.C. § 102 be withdrawn. Additionally, claims 3-6 and 9-13, which depend from independent claim 1, are allowable at least because their base claim is allowable, as well as for the additional features recited therein.

## CONCLUSION

In view of the foregoing, Applicant respectfully requests reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of the response, the Examiner is invited to contact the Applicant's undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 04-2223. If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

**DYKEMA GOSSETT PLLC**

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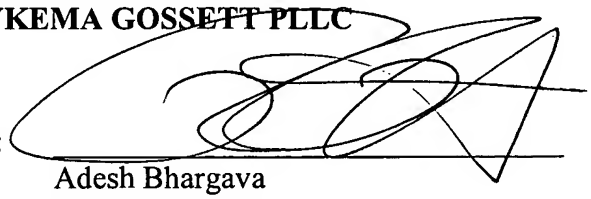
By: 

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